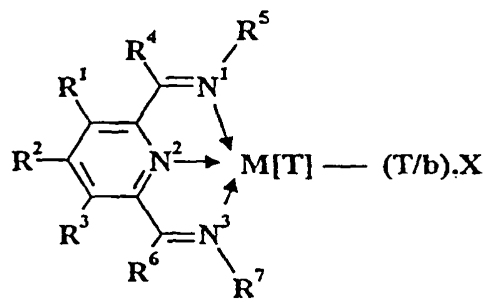
Claims:

1. Polymerisation catalyst comprising

(1) a compound of the Formula B:

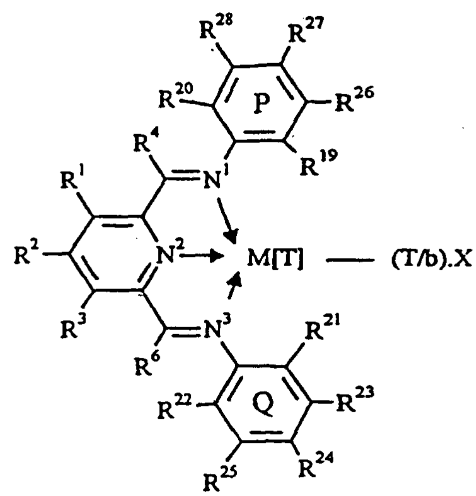


Formula B

wherein M is Fe[II], Fe[III], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] orRu[IV]; X represents an atom or group covalently or ionically bonded to the transition metal M; T is the oxidation state of the transition metal M and b is the valency of the atom or group X; R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl; and when any two or more of R^1 - R^7 are hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl, said two or more can be linked to form one or more cyclic substituents; and

(2) a further catalyst.

2. Catalyst according to claim 1 wherein compound (1) has the following Formula Z



Formula Z

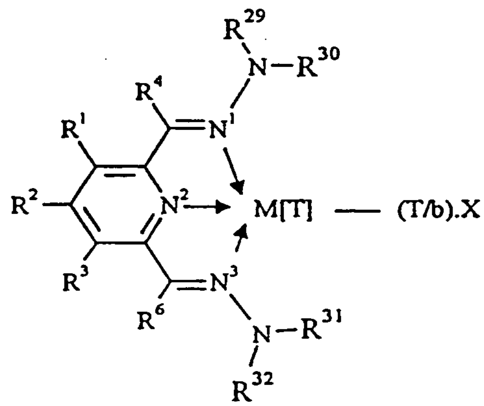
wherein M is Fe[II], Fe[III], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] orRu[IV]; X represents an atom or group covalently or ionically bonded to the transition metal M; T is the oxidation state of the transition metal M and b is the valency of the atom or group X; R^1 to R^4, R^6 and R^{19} to R^{28} are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl; when any two or more of R^1 to R^4, R^6 and R^{19} to R^{28} are hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl, said two or more can be linked to form one or more cyclic substituents; with the proviso that at least one of R^{19}, R^{20}, R^{21} and R^{22} is hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl when neither of the ring systems P and Q forms part of a polyaromatic fused-ring system.

3. Catalyst according to claim 2 wherein neither of the ring systems P and Q forms part of a polyaromatic ring system, and wherein at least one of R^{19} and R^{20}, and at least one of R^{21} and R^{22} is selected from hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl.

4. Catalyst according to claim 2 wherein neither of the ring systems P and Q forms

part of a polyaromatic fused-ring system and wherein each of R^{19}, R^{20}, R^{21} and R^{22} is selected from hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl.

5. Catalyst according to claim 1 wherein the Formula B compound has the following Formula T



Formula T

and wherein M is Fe[II], Fe[III], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] orRu[IV]; X represents an atom or group covalently or ionically bonded to the transition metal M; T is the oxidation state of the transition metal M and b is the valency of the atom or group X; R^1 to R^4, R^6 and R^{29} to R^{32} are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl; when any two or more of R^1 to R^4, R^6 and R^{29} to R^{32} are hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl, said two or more can be linked to form one or more cyclic substituents.

6. Catalyst according to any preceding claim wherein X is selected from halide, sulphate, nitrate, thiolate, thiocarboxylate, BF_4^-, PF_6^-, hydride, hydrocarbyloxide, carboxylate, hydrocarbyl, substituted hydrocarbyl and heterohydrocarbyl.

7. Catalyst according to claim 6 wherein X is selected from chloride, bromide, iodide, methyl, ethyl, propyl, butyl, octyl, decyl, phenyl, benzyl, methoxide, ethoxide, isopropoxide, tosylate, triflate, formate, acetate, phenoxide and benzoate.

8. Catalyst according to any preceding claim wherein catalyst (2) comprises a Ziegler Natta catalyst, a Phillips type (chromium oxide) catalyst, a metallocene catalyst, a monocyclopentadienyl constrained geometry type catalyst or a bidentate α-diimine late transition metal catalyst.

9. Catalyst according to claim 8 wherein the further catalyst (2) comprises a heterogeneous catalyst or a supported catalyst which provides a support for compound (1).

10. Catalyst according to any of claims 1 to 7 wherein compounds (1) and (2) are each independently a transition metal compound of Formula B.

11. Catalyst according to any preceding claim which additionally comprises (3) an activating quantity of an activator compound comprising a Lewis acid capable of activating the catalyst for olefin polymerisation.

12. Catalyst according to claim 11 wherein the activating compound comprises an organoaluminium compound or a hydrocarbylboron compound.

13. Process of making a catalyst as defined in claim 11 or 12 wherein catalyst (2) is a Ziegler-Natta catalyst, and components (1) and (3) are premixed prior to addition to (2).

14. Catalyst according to any preceding claim which additionally comprises (4) a neutral Lewis base.

15. Process for the polymerisation or copolymerisation of 1-olefins, comprising contacting the monomeric olefin(s) under polymerisation conditions with a polymerisation catalyst as defined in any preceding claim.

16. Process according to claim 15 wherein the polymerisation is conducted in the presence of hydrogen as a molecular weight modifier.

17. Process according to claim 15 or 16 wherein the polymerisation conditions are solution phase, slurry phase or gas phase.

18. Process according to claim 17 wherein the polymerisation is conducted under gas phase fluidised bed conditions.

19. Process according to claim 17 wherein the polymerisation is conducted in slurry

phase in an autoclave or continuous loop reactor.

20. Process according to any one of claims 15 to 19 which comprises the copolymerisation of ethylene and a further 1-olefin, wherein the degree of short chain branching per thousand carbons (SCB) in the resultant copolymer is greater than zero and also equal to or greater than 18.18R - 0.16 where R is the ratio of partial pressure of the further 1-olefin to that of ethylene.

21. Process according to claim 20 wherein the SCB is greater than or equal to 18.18R - 0.05, preferably 18.18R - 0.04.

22. Copolymer of ethylene and a further 1-olefin having an SCB of 2.0, preferably 3.0 or greater and comprising residues of a nitrogen-containing iron complex, wherein the iron concentration is from 0.01 to 1000 parts by weight per million parts of copolymer, preferably 0.01 to 10 ppm by weight, for example 0.11 to 1.03 ppm by weight.

23. Method of selecting the portion of the molecular weight distribution of a copolymer of ethylene and a further 1-olefin in which units of said further 1-olefin are located, comprising contacting the monomeric olefins under polymerisation conditions with a polymerisation catalyst as defined in any one of claims 1 to 13.

24. Copolymer of ethylene and a further 1-olefin which contains residues of a nitrogen-containing iron complex wherein the iron concentration is from 0.01 to 10 parts by weight per million parts of copolymer, and in which at least 50% of the short chain branching is located in the 50% by weight of the copolymer having the highest molecular weight.

25. Copolymer of ethylene and a further 1-olefin wherein the degree of short chain branching per thousand carbons (SCB) is from 2.0 to 10, and the relationship of modulus in MPa (M) to SCB (B) is defined by the equation M = k - 62.5B where k is 820 or greater.

26. Copolymer according to claim 25 wherein the SCB is between 2 and 8.

27. Copolymer according to claim 25 wherein the SCB is greater than 2.5, preferably greater than 3.0.

28. Copolymer according to one of claims 25 to 27 wherein k is 830 or greater, preferably 840 or greater, more preferably 850 or greater.

29. Copolymer according to one of claims 25 to 27 wherein $M = k - 65.5B$ where k is 850 or greater, preferably $M = k - 67.5B$ where k is 870 or greater, and more preferably $M = k - 70.5B$ where k is 900 or greater.

30. Copolymer according to one of claims 25 to 27 wherein $M = k - 60B$ where k is 815 or greater, preferably $M = k - 57.5B$ where k is 810 or greater, and more preferably $M = k - 55B$ where k is 805 or greater.